

Agricultural pesticides

To spray or not to spray

Banning pesticides may be an over-reaction and can mean the world's poor stay hungry, says Jon Entine

"Name a vegetable and I'll tell you how dangerous it is," says Brian Hill, senior scientist in the US for the Pesticide Action Network, the NGO leading the campaign to more tightly regulate agricultural chemicals.

I named broccoli, my daughter Maddie's favourite vegetable. His voice turned grave. "The US Department of Agriculture tested 671 samples in 2007. Forty different residues showed up. Five are known or possible carcinogens; 19 are suspected hormone disrupters; three can cause developmental or reproductive problems; nine are considered neurotoxins."

Dad alert. Am I feeding my kid lethal leafy greens? I cross-checked with the US Department of Agriculture and found that 28 different chemical residues were found on one broccoli bunch.

The food balance

Pesticides protect crops against weeds, insects and fungus. They are one of the drivers of the green revolution that has dramatically cut world hunger in the past 60 years. The undeniable reality, however, is that none of us wants toxins as a side dish. So we need to make sure that we use only what we need to use, balancing risks and benefits, particularly the need to protect consumers and grow food for the rest of the world. The battle is over how to achieve that balance.

According to Hill, 1,100 pesticides can be found in the US food supply while there are 350 in Europe. Under EU rules, only 16 of the 40 chemicals found on US broccoli samples are currently approved for use. By his judgement, and that of many environmentalists with a visceral reaction against the

word "chemical," that means the EU is safer and more responsible.

Now it's setting even more stringent standards. An additional 22 chemicals representing about 15% of all pesticides used in the EU will be banned in a phased process as a result of legislation agreed by the European parliament earlier this year and expected to be formally approved in the summer. The substances have been linked in laboratory studies to cancer, endangering reproduction or damaging genes.

The new regulations are revolutionary, and have spooked many scientists not so enamoured with visceral judgments. Europe has traditionally taken a more stringent approach to environmental regulation than the rest of the world in part because of the popularity of the precautionary notion that any product in which the safety cannot be totally guaranteed or all the dangers not known should not be approved for use.

Perhaps the biggest victims of this reliance on the fear factor are genetically modified foods, which are caricatured, without evidence, as being technologically created Godzillas set to ravage health and human civilization.

The heart of the controversy is the debate over risk versus hazard. Risk describes the probability that dangers will materialise. Under long-standing worldwide scientific protocol, pesticides are considered safe if, based on established studies on animals, they pose no known risk to our health at the levels found in food. The key is setting the threshold. Under the hammer of government regulators, scientists are ultra-cautious – setting limits far below levels at which products are



Must dust?

consumed in the real world and likely to accumulate in tissues. So long as a substance used in prescribed quantities has not been proven to cause any problems, it has been allowed onto the market.

The EU has gradually evolved a more radical standard based on the precautionary notion, which requires an absolute knowledge of safety. Critics such as Elliott Cannell, who oversaw Pesticides Action Network Europe's lobbying effort on behalf of the new rules, have long argued that threshold analysis is rife with subjectivity; he calls it pseudo-science. The new regulations abandon threshold analysis for the new hazard standard. Anti-pesticide activists are now eager to extend the new EU structure to more chemicals, and they hope to export this analytical model to the US, where they expect to catch the ear of a sympathetic Obama administration.

One of your five portions

Most scientists, with notable exceptions, are not quite so enthused. Ian Denholm, head of the Plant and Invertebrate Ecology Department at Rothamsted Research Institute in Hertfordshire, UK, the oldest and most renowned independent agricultural research centre in the world, believes the EU ban will have "genuinely alarming consequences". The UK Pesticides Safety Directorate claims the blacklist will damage farming and provide few health benefits. Independent studies predict that yields of carrot,



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cabbage, parsnip, onions, cereals and the venerable broccoli may fall by a fifth or more.

Denholm and some 160 other leading scientists throughout the world signed a petition opposing the regulations, contending that traditional science was being abandoned under pressure from politicians responding to hysterical constituents much in the same way as they capitulated to unproven warnings of killer GMOs (genetically modified organisms). The new rules, they say, show “a worrying lack of concern for the real risks to health and development to which most people in developing countries are exposed”.

Agricultural scientists stress they are not pro-chemical but pro-crop-protection with a central focus on food security. All food production carries some degree of risk. What risks are acceptable and how do you manage them? Rather than focusing myopically on relatively affluent European consumers, they take a broader perspective, looking at the risk to financially squeezed European farmers, whose crop output and income will be cut and to developing countries that will have to pay higher prices for European agricultural exports.

Agriculture accounts for more than 40% of world exports in primary products, with Europe trailing only the US as provider to the world’s food basket. Europe produces about 16% of the developing world’s cereal grains and substantial amounts of its fruits and vegetables. The blacklist will cut production at a time when policy experts are warning that Europe must double its output by 2050 to deal with the effects of climate change. A report issued in April by the Group of Eight nations warned that the food crisis of the past two years “will become structural in only a few decades” unless production is dramatically ramped up.

“Unfortunately, the EU’s agricultural and pest management policies are currently heading in the opposite direction, actively reducing the options available to farmers without adequate scientific



Fewer pests worth the risk?

assessment of risk,” says Friedhelm Schmider, director-general of the Brussels-based European Crop Protection Association.

Poverty and precaution

Do we really want to be telling the hungry of the world to persist on a diet of precaution? “As a region favourable for crop production, Europe cannot opt out of its responsibility to be part of the world,” says John Lucas, Denholm’s colleague at Rothamsted. “We may not have to worry here because no one goes hungry and we can afford higher prices. But that’s not true elsewhere. This is about food security. We have a moral responsibility to feed the hungry.”

Another big fear, say scientists, is that the restrictions could backfire and create a new generation of more dangerous fungal crops, weeds and insects that quickly become resistant to a more limited palette of chemicals.

One wild card in this debate is the uncertainty surrounding mixing chemicals. Chemicals that test safe when used individually on crops may prove problematic when mixed with other chemicals that

also appear safe when used alone. There is always an element of uncertainty, which plays to the precaution crowd. “It’s about how much risk is tolerable,” Lucas acknowledges.

So, how dangerous is that broccoli? It turns out that it is relatively chemical-free compared with most fruits and vegetables. According to the Environmental Working Group, one of the leading campaigners in the US against pesticides, broccoli is one of the safest vegetables, with more than 65% of all samples showing no residue. Those with chemicals could be easily washed. The tiny amount that might be consumed falls well below established minimum safety levels.

“I have kids,” says an exasperated Lucas. “I obviously don’t want them to eat toxin-laced food. The critics are driven by emotion. We have to be sensible about this, and also responsible to everyone and not just focus on our fears.”

OK Maddie, eat your broccoli. ■

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